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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/803,615

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Hibiki Itoh

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EXAMINER

LEE, CYNTHIA K

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/803,615	Applicant(s) ITOH, HIBIKI	
	Examiner CYNTHIA LEE	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 15-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 15-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/18/08, 11/13/08</u> | 6) <input type="checkbox"/> Other: _____ |

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/13/2008 has been entered.

Response to Amendment

This Office Action is responsive to the amendment filed on 11/13/2008. Claims 1-12 and 15-19 are pending.

Applicant's prior art arguments have been considered, but are not persuasive. Claims 1-12 and 15-19 are rejected for reasons stated herein below.

Double Patenting Rejection

Terminal Disclaimer has been approved by the Office on 11/19/2008. Hence, the Double Patenting rejection has been withdrawn.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-12 and 15-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably

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convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The limitation “without any passage through any other gas flow path or passage in the first porous substrate” is not supported by the disclosure as originally filed. The Examiner notes that the reactant gas must pass through the passage in the first porous substrate because the substrate is porous and the “porous substrate is the only gas flow path in the first electrode member”.

Applicant is required to cancel the new matter in reply to this Office Action.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-12 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear how the reactant gas does not pass through the porous substrate when the ‘substrate is porous’ and the “porous substrate is the only gas flow path in the first electrode member”. Clarification is required.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8, 11-12, 17, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poeppel et al. (US 4,476,196) in view of McPheeters (US 5330859).

Poeppel et al. discloses a solid oxide side fuel cell having monolithic cross flow core and manifold comprising the following:

an insulated core with thin layers of an electrolyte and intermediate film (or separator) material sandwiched between layers of porous anode and cathode electrodes respectively; See Claim 1 of Poeppel et al., Column 4 Lines 52-61, Column 6 Line 20 to Column 7 Line 6, Column 8 Line 8 to Column 9 Line 5; The separator material in the current application (second sentence of paragraph 43) is disclosed as a strontium doped lanthanum chromite based oxide such as lanthanum chromite. The intermediate film material in the reference is lanthanum chromite (See Column 3 Line 17).

a core that has passageways for gas flow paths that are laid out in a crosswise or orthogonal pattern and has transverse manifolds for delivery and removal of reactant material;

with conductive web walls or conductive spacers between the individual cells and in the parallel and perpendicular direction respectively depending if it is an anode or cathode web wall See Column 7 Line 45 to Column 8 Line 7;

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an electrolyte and separator material formed via the tape cast method (wetted process) for adhering to the anode and cathode electrode. See Column 8 Line 8-17;

a ceramic paste is used to pack annular space to seal the structure and prevent gas leakage, See Column 6 Lines 52-56;

Conductors or conductive jointing material that link the individual fuel cells See Column 7 Line 30;

a thin layer of electrolyte material **44** can be folded down or up on the side or end portions **64** of the anode and cathode. See Figure 3, See Column 8 Line 64.

The folded material encloses the side or end portions to separate the fuel and oxidant gases on opposite sides of the porous electrode material (Column 8 Line 67 to Column 9 Line 4). The passageways for the fuel are formed with only anode electrode material. The passageways for the oxidant are formed with only the cathode electrode material (Column 6 Lines 57-66).

14. Poeppel et al. discloses that the fuel flow and the oxidant flow are transverse or orthogonal with respect to each other (Column 6 Lines 43-47).

The reference teaches the use of anode, cathode, electrolyte, and separator materials that are matched as closely as possible to one another with respect to each coefficient of thermal expansion. See Column 9 Lines 25-40.

15. Claim 4 is a product-by-process claim. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the

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product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process. In re Thorpe, 777 F. 2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Poeppel et al. discloses the same or an obvious variant of the applicant's electrolyte and separator films. The applicant's process has not been given patentable weight in this claim.

16.

17. Regarding the limitation "scrapped off", it is being interpreted as a product-by-process limitation. It is noted that the electrolyte (applicant's seal portion) of Poeppel does not exist on the side surfaces of the cathode 42, and thus meets the limitation "scrapped off." Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process. In re Thorpe, 777 F. 2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Poeppel et al. discloses the same or an obvious variant of the applicant's electrolyte and separator films. The applicant's process has not been given patentable weight in this claim.

It is noted that an entire cross section of the electrodes form a gas flow path because the electrode materials are porous (8:48-50)

Regarding claims 1 and 12, Poeppel discloses a cathode with pores, but does not disclose an electrode absent of through-passages, that are connected by the pores, that extend from one side surface to another side surface (14 in fig. 3). McPheeters teaches a solid oxide fuel cell comprising a cathode layer and an anode layer with pores and are absent of through-passages, that are connected by the pores, that extend from one side surface to another side surface (12 and 14 in fig. 4). It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the shape of the cathode of Poeppel to be free of through-passages that are connected by the pores, for the benefit of reducing the thickness of Poeppel's fuel cell.

Further, Poeppel discloses that the anode and cathode are porous to the degree required to allow the fuel and oxidant gases to combine at the electrolyte (8:48-51). It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the shape of the cathode of Poeppel to be free of through-passages that are connected by the pores, as taught by McPheeters, for the benefit of varying the gas flow of the reactant gas depending on the power requirement of the intended application. Poeppel discloses that porosity is a result effective variable. It has been held by the courts that discovering an optimum value or workable ranges of a result-effective variable involves only routine skill in the art, and thus not novel. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See MPEP 2144.05.

Claims 9, 15, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poeppel et al. (US 4,476, 196) in view of McPheeters (US 5330859) as applied to claim 5, and further in view of Ketcham et al. (US. 6,045,935).

Poeppel et al. discloses a solid oxide fuel cell having monolithic cross flow core and manifolds as discussed above and incorporated herein. Poeppel et al. discloses all the limitations of claims 15 except that the air flow path and the fuel flow path are parallel and that the reactants flow co-current or counter-current with respect to each other. Ketcham et al. teaches (see Figure 2), the air flow path and the fuel flow path (**35, 36**) are arranged parallel and the reactants flow in a co-current arrangement with respect to each other inside the perforated ceramic tube **38** (Figure 3; col. 5 lines 49-63). In Figure 4, the air flow path and the fuel flow path (**82, 84**) are arranged parallel and the reactants flow in a counter-current arrangement through the center ceramic tube **38** (col. 6 lines 40-42; Figure 5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the flow path of arrangement of Poeppel et al. to have the reactants flow path arranged parallel with respect to each other and the reactants flowing in a co-current or counter-current design such as taught by Ketcham et al. It has been held by the courts that the rearrangement of parts requires only ordinary skill in the art. In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950)

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With respect to claims 9 and 18, Poeppel et al. discloses a solid oxide fuel cell having monolithic cross flow core and manifolds. Poeppel et al. discloses all the limitations of claim 9 as discussed above and incorporated herein except that the manifold structures or plates attached to the side surfaces of the laminated body are formed of a glass-ceramic (a type of ceramic). Ketcham et al. teaches a solid oxide fuel cell. Ketcham et al. also teaches that glass-ceramic is used for manifold in solid oxide fuel cells because the glass-ceramic closely matches the expansion properties of the electrolyte (see col. 3, line 65 to col. 4, line 14).

18. Poeppel et al. discloses that the manifolds on opposite sides of the fuel cell are connected via one or the other of the fuel or air passageways (Column 6 Lines 20-35).

19. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use glass-ceramic as the material of construction for the manifolds of Poeppel et al. as taught by Ketcham et al. because the glass ceramic material closely matches the expansion properties of the electrolyte in the solid oxide fuel cell stack. This will alleviate the loss of contact between the manifold and the surface of the laminate body thereby maintaining a proper seal.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Poeppel et al. (US 4,476, 196) in view of Ketcham et al. (US. 6,045,935) and McPheeters (US 5330859) as applied to claim 9, and as evidenced by Morgan Advanced Ceramics Datasheet for Glass Ceramic.

The disclosures of Poeppel et al. and Ketcham et al. as discussed above are incorporated herein. Neither Poeppel et al. nor Ketcham et al. explicitly teach that the glass ceramic manifolds are free-cutting glass ceramic. The Morgan Advanced Ceramics Datasheet for Glass Ceramic states that one of the main advantages of glass ceramic is that it can be machined quickly and economically into complex shapes and precision parts using ordinary metal working tools. See www.morganadvancedceramics.com/materias/gc.htm The free-cutting property of the glass-ceramic is an inherent property. See MPEP 2112. The claiming of an inherent property is not patentable. See *In re Napier*, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir.1995) and *In re Grasselli*, 713 F.2d 731, 739, 218 USPQ 769, 775 (Fed. Cir. 1983).

Response to Arguments

Applicant's arguments filed 11/13/2008 have been fully considered but they are not persuasive.

Applicant argues that there is no motivation to combine Poeppel and McPheeters because the passageway disclosed in Poeppel cannot be provided in an electrode member itself owing to the thin electrode so that the fuel channel and the air channel are provided to flow the gas along an electrode surface because in Poeppel, it is necessary to secure a gas flow property by defined separated spaces such as passageways 13 and 14. and the gas flow property is not sufficient only with the porosity of the electrode member itself.

The Examiner remains unpersuaded. Poeppel discloses in 8:48-51 that the electrodes are porous to the degree required to allow the fuel and oxidant gases to combine at the electrolyte but does not disclose that the passageways are necessary to secure gas flow. Thus, the rejection is maintained.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cynthia Lee/

/PATRICK RYAN/

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Examiner, Art Unit 1795

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